Patent Claims

1. A process for the dimensionally accurate precision casting production of components from nonferrous metal alloys, in particular for use in the turbine engineering sector, using casting molds which correspond to the external shape of the components to be produced in each case, comprise heated mold shells and to which the melt is supplied via a heated, rotatably mounted runner device, in such a manner that the casting molds are completely filled by means of acceleration forces, including the Coriolis forces of the centrifugal forces applied to the melt.

2. The process as claimed in claim 1, characterized in that the melt for the casting operation, in the runner device, is diverted through approximately 30° to 180° by means of the centrifugal forces counter to the direction of flow determined by the force of gravity, and as it flows into the casting molds is forced to homogeneously fill the casting molds by the acceleration forces, including the Coriolis forces.

3. The process as claimed in claims 1 and 2, characterized in that the heated, rotatably mounted runner device and the heated casting molds are held at predetermined process temperatures which correspond to the nonferrous metal alloy used for the precision casting production, maintain the ability of this alloy to flow and are preferably 10° to 200°C above the melting point of the nonferrous metal alloy.

4. The process as claimed in claims 1 to 3, characterized in that the melt is produced outside or inside the runner device.

5. The process as claimed in claims 1 to 4, characterized in that for controlled lowering of the cooling rate of the precision-cast components which are still in the casting molds, these components are heated to 100°C to 900°C.

6. An apparatus for carrying out the process as claimed in claims 1 to 5, characterized in that the runner device (11) used is a vertically positioned, rotatably mounted, cup-like vessel (15) with a base surface which is designed to be favorable in terms of fluid dynamics, with which

vessel the casting molds (22), which are arranged at its lateral surface (side wall 16), at a predetermined distance (a) from the base surface (18), and comprise mold shells, are in communication, the three-dimensional setting angle (sr) of which casting molds with respect to the respectively associated outlet opening (19), which is designed to be favorable in terms of fluid dynamics, in the vessel (15), is adjustable, all this being arranged in such a manner that the casting molds are filled homogeneously without any flow detachment in the melt.

7. An apparatus for carrying out the process as claimed in claims 1 to 6, characterized in that the vessel (15) in the runner device (40) is mounted rotatably relative to the adjustably arranged (three-dimensional angle sr) casting molds (22) and is provided with a closable cover (44) to receive an ingot which consists of nonferrous metal alloys and corresponds to the internal diameter of the vessel.

8. The apparatus as claimed in claim 7, characterized in that the casting molds (22) are arranged close to the upper edge of the vessel (15), with their inlet openings assigned to a distributor (42) which has a nozzle action and is arranged inside the vessel (15).

9. The apparatus as claimed in claims 6 to 8, characterized in that vessel (15) and casting molds (22) consist of a ceramic which is relatively unreactive with respect to the melt and has included metal particles.

10. The apparatus as claimed in claim 6, characterized in that a runner channel (14), which is used to supply the melt, is designed to be favorable in terms of fluid dynamics of the melt and likewise consists of ceramic which is relatively unreactive with respect to the melt and has included metal particles.

11. The apparatus as claimed in claim 6, characterized in that the vessel and casting molds consist of coated steel, coated graphite, tantalum, titanium or niobium.

12. The apparatus as claimed in claims 6 to 11, characterized in that the runner device (10) and the casting molds (22) are heated inductively or by means of microwaves.

13. A nonferrous metal alloy for carrying out the process as claimed in claim 1, based on a TiAl metal alloy comprising 30 to 33% by weight of Al, 4 to 6% by weight of Nb, 0.5 to 3% by weight of Mn and 0.1 to 0.5% by weight of B, remainder Ti.

14. The nonferrous metal alloy as claimed in claim 13, based on a TiAl metal alloy with an oxygen content of from 0 to 2000 ppm, a carbon content of from 0 to 2000 ppm, preferably 800 to 1200 ppm, an Ni content of 100 to 2000 ppm and an N content of 0 to 2000 ppm.